

**WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY**  
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**MARCH 2008 REPORT**

Note to Readers: Pages 1-14 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 15.

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## **Item 1. Continually Rising Food Prices Threaten Long-Term Global Stability**

According to UN data, global food prices rose 35% this year and have already risen 65% since 2002. Biofuels competition for land and water, climate change, oil prices, and increasing population and incomes all contribute to the long-term increases in food prices. The Food and Agriculture Organization found that dairy prices rose nearly 80% and grain 42% in 2007. With nearly 3 billion people making \$2 or less per day, long-term global social conflict seems inevitable without more serious food policies, scientific breakthroughs, and dietary changes.

### **Military Implications:**

Global, regional, and selected national scenarios on rising food prices and resulting social conflicts should be created to help understand security priorities and points of intervention. The scenario teams should draw on the expertise of FAO, the World Food Program, UNHCR (UN High Commissioner for Refugees), USAID, and others with direct field data experience.

### **Source:**

Tensions Rise As World Faces Short Rations

<http://www.planetark.com/dailynewsstory.cfm/newsid/47716/story.htm>

## **Item 2. EU, Latin American and Caribbean Countries Environment Cooperation**

The first meeting of the EU, Latin American, and Caribbean countries' environment ministers took place in Brussels, March 4, 2008, in a pre-meeting to the high level summit to be held in Lima, in May. More than two dozen environment ministers attended the meeting aiming to identify common priorities in order to increase environmental efforts and better integrate them in the EU-LAC countries' areas of cooperation. The focus was on collaboration strategies between the two regions for addressing climate change, renewable energy, biodiversity loss, and deforestation. The EU has already pledged considerable funds to help the region in domains such as natural resource management, renewable energy and energy efficiency, forest management, climate change mitigation, greenhouse gas reduction, carbon sequestration, and governance.

### **Military Implications:**

With the high priority EU gives to environmental regulations, it is reasonable to expect new regulations to increase environmental protection in the LAC region. Relevant military personnel should follow the outcomes of the May Lima Summit and identify opportunities for applications of the Army Strategy on the Environment to hemispheric security.

### **Source:**

First ever meeting of environment ministers from EU and Latin America and Caribbean countries held in Brussels

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/381&format=HTML&aged=0&language=EN&guiLanguage=en>

### **Item 3. United Arab Emirates Establish Nuclear Agency**

The United Arab Emirates' governing Cabinet approved the establishment of the new Nuclear Energy Authority, with "the mandate to evaluate and develop a peaceful nuclear energy program in line with the recommendations of the International Atomic Energy Agency" as part of its civilian nuclear power program.

#### **Military Implications:**

Although the UAE is working closely with the IAEA to assure security standards in the spirit of nuclear non-proliferation, relevant scientific and military community members should consider offering assistance to the new Nuclear Energy Authority on security procedures commensurate with the region's vulnerability.

#### **Source:**

UAE to set up nuclear agency

<http://www.gulfnews.com/nation/Government/10199893.html>

### **Item 4. Shipwrecks Removal Treaty Received First Signature**

The Nairobi International Convention on the Removal of Wrecks adopted in May 2007 provides an international legal framework to deal with shipwrecks presenting possible safety and/or environmental hazards. According to the International Maritime Organization, the number of abandoned shipwrecks worldwide is estimated to be 1,300, and the threat they represent has been increasing. The convention provides the legal basis for States to remove the wrecks, or have them removed, and have the registered owner liable for costs incurred. The Convention is open for signature until November 18, 2008, thereafter being open for ratification, accession or acceptance; it will enter into force 12 months after the date it receives ten ratifications (or accessions or acceptances).

#### **Military Implications:**

The military/Navy should explore military-to-military opportunities for international cooperation on such ship removals.

#### **Sources:**

Estonia the first to sign UN-backed sea wreck treaty

<http://www.un.org/apps/news/story.asp?NewsID=26130&Cr=maritime&Cr1=>

New international treaty on wreck removal adopted in Nairobi

[http://www.imo.org/About/mainframe.asp?topic\\_id=1472&doc\\_id=8070](http://www.imo.org/About/mainframe.asp?topic_id=1472&doc_id=8070)

### **Item 5. Technological Advances with Environmental Security Implications**

#### **5.1 Ionic Liquids Provide Safe Alternative to Mercury**

Robin Rogers of Queen's University, Belfast, UK, and his colleagues have discovered that ionic liquids (IL)—salts in liquid form—are an environmentally safe substitute for mercury in thermometers. Gary Baker, of the Oak Ridge National Laboratory in the U.S., also points out that ILs are potentially green replacements for conventional solvents in other applications.

**Military Implications:**

Considering the call for a global ban on mercury, the military should investigate the use of these compounds as environmentally friendly substitutes to possibly hazardous materials, including mercury.

**Source:**

New ionic liquid in thermometers beats mercury on range, performance and safety

<http://www.rsc.org/AboutUs/News/PressReleases/2008/ILThermometers.asp>

## 5.2 New Detection and Cleanup Technologies

### 5.2.1 New Rapid Portable Chemical Sensor

Guardion-7, a 28-pound, briefcase-sized unit is a portable chemical sensor that can identify nerve agents, explosives and other substances within five minutes, with high accuracy, even in extreme climates, apparently without false-positive readings found in current sensors. It was developed by Brigham Young University scientist Milton Lee and has been successfully tested at the Dugway Proving Ground in Utah. The U.S. Defense Threat Reduction Agency certified its accuracy in February. Research continues to make the device even smaller and lighter.

**Military Implications:**

Since repercussions of hazardous chemicals know no boundaries, the military should consider sharing such devices with civilian and international military counterparts to reduce international environmental and health threats from the use of chemical agents and accidental releases of hazardous industrial substances and for use in discovering and delineating contaminated sites.

**Source:**

BYU scientist creates chemical detector

<http://www.deseretnews.com/article/1,5143,695263396,00.html>

### 5.2.2 Reusable Carbon Aerogel Adsorbs Organic Solvent Pollutants

A monolithic carbon aerogel that will adsorb organic solvent pollutants such as benzene, toluene and xylene, and that can be easily regenerated and used repeatedly has been produced by David Fairén Jiménez and other researchers at the Univ. of Granada in Spain.

**Military Implications:**

The military should investigate these materials for their use in systems for personal protection devices and for cleaning up polluted environments.

**Source:**

Creation of a new material capable of eliminating pollutants by the hydrocarbon industry

[http://www.eurekalert.org/pub\\_releases/2008-02/udg-coa022608.php](http://www.eurekalert.org/pub_releases/2008-02/udg-coa022608.php)

### 5.2.3 New Material Strips out Radioactive Debris

Scientists at the U.S. Department of Energy's Argonne National Laboratory and Northwestern University developed a layered sulfide compound, which very efficiently strips out radioactive strontium-90 from nuclear waste. They are now experimenting with the compound's ability to isolate such other common radioactive elements as cesium and uranium.

**Military Implications:**

The military should follow this work to assess its applicability to cleanup of radioactive contamination.

**Source:**

Compound removes radioactive material from power plant waste

[http://www.anl.gov/Media\\_Center/News/2008/news080313a.html](http://www.anl.gov/Media_Center/News/2008/news080313a.html)

#### 5.2.4 New Type Nanoscale Transistor Would Aid DNA Detectors

A mathematical simulation developed by Samuel Afuwape of National University, in San Diego, helps to design a new type of nanoscale transistor for a portable DNA detector for testing contaminated sites. The new nanoscale ion-selective field-effect transistor (ISFET) could be integrated into a biosensor containing thousands of DNA sequences that would bind with DNA sequences in a sample, producing changes in conductivity detectable by the ISFET. The miniature DNA detector would have broad application, including bioweapons detection.

**Military Implications:**

The military should follow the development of this component for its possible applicability in nanotech-based biological monitoring systems for the environment.

**Source:**

A handheld DNA detector may soon be a reality

<http://www.topnews.in/health/handheld-dna-detector-may-soon-be-reality-21411>

### **5.3 Increasing Energy Efficiency Technologies**

#### 5.3.1 New “Green IT” Software under Development

A group at Oxford University’s Environmental Change Institute started development of “software that is free and easy to download, which will make networked computers more energy-efficient and reduce carbon emissions by saving on electricity needs.” The software will eventually be available from the project website: <http://projects.oucs.ox.ac.uk/lowcarbonict>.

**Military Implications:**

Military personnel responsible for the management of large computer installations or networks should test this software for possible large-scale use.

**Sources:**

Oxford University launches research project for low carbon computing

<http://www.eci.ox.ac.uk/news/press-releases/080317low-itc.pdf>

Oxford University to Develop Free Green Computing Software

[http://www.greenercomputing.com/news\\_third.cfm?NewsID=55791](http://www.greenercomputing.com/news_third.cfm?NewsID=55791)

#### 5.3.2 Energy/Performance Benchmark for Workstations under Development

A new, environmentally-oriented project of the Standard Performance Evaluation Corporation (SPEC) Graphics and Workstation Performance Group is “working on the benchmark for performance in relation to power consumption, incorporating current benchmarks for 3D graphics as well as looking at workloads for rendering, financial modeling, video encoding and other processes” announced a *Greener Computing* news story. SPEC will be submitting the benchmark to EPA for use in its Energy Star rating system.

**Military Implications:**

Personnel responsible for acquisition of workstations should consider the use of this benchmark, when available, for equipment evaluation with respect to environmental impact.

**Source:**

SPEC Developing Benchmark for Workstation Power Use, Performance

[http://www.greenercomputing.com/news\\_third.cfm?NewsID=55773](http://www.greenercomputing.com/news_third.cfm?NewsID=55773)

**Item 6. Chemical Emission Certification Extended to Electronic Devices**

GREENGUARD Environmental Institute (GEI), the country's largest certifier of chemical emissions from building products and furnishings, is expanding its certification efforts to include computers and other electronic devices. According to an Institute announcement, "The GREENGUARD program measures chemical 'outgassing' of the product during normal use and operation. Measured emissions are then compared to an extensive list of publicly available short term and long term health risk exposure levels available from the US Environmental Protection Agency, Occupational Safety Health Administration, the state of California, and CDC's Registry of Toxic Substances."

**Military Implications:**

Responsible military personnel should investigate the use of these certifications, as they become available, for environmental evaluation of electronic equipment.

**Source:**

GREENGUARD Expands into Certifying Computers & Electronics

<http://www.greenguard.org/Default.aspx?tabid=43&ItemId=451>

**Item 7. Updates on Previously Identified Issues**

**7.1 Biological Weapons Convention Lacks Enforcement Mechanism, Warns Russian General**  
Col. Gen. Vladimir Filippov, commander of Russia's WMD protection force, warned that the Biological Weapons Convention lacks enforcement mechanisms that would help prevent nations and terrorists from producing biological warfare agents. The issue was also previously raised by the Nonaligned Nations Movement at the 2007 meeting of states parties. The next Meeting of States Parties is scheduled for December 2008 and the review conference of the BWC is planned for 2011. [See also *Progress for Enforcing Biological Weapons Convention* in December 2007 and *Sixth Review Conference of the Biological Weapons Convention* in December 2006 and other related environmental security reports.]

**Military Implications:**

Considering the pressure from high profile officials and organizations, it is reasonable to speculate that the enforcement issue will get on the agenda of the next BWC meetings. The military should collaborate with its counterparts in designing enforcement mechanism to help reduce as much as possible the threats of biological weapons or accidents.

**Source:**

Enforcement Needed for BWC, Russian General Says

[http://www.nti.org/d\\_newswire/issues/2008\\_3\\_12.html#9729B07E](http://www.nti.org/d_newswire/issues/2008_3_12.html#9729B07E)

## 7.2 Arctic Disputes Continue

An authoritative report, *Climate Change and International Security* [see item 8.1], to the European Council, among other recommendations for addressing security issues in the new context of climate change, recommends “Develop an EU Arctic policy based on the evolving geo-strategy of the Arctic region, taking into account i.a. [inter alia] access to resources and the opening of new trade routes.” It notes, “The increased accessibility of the enormous hydrocarbon resources in the Arctic region is changing the geo-strategic dynamics of the region.” A recent U.S. survey revealed that the Alaska continental shelf might extend more than 100 nautical miles farther from the U.S. coast than previously assumed, therefore eventually giving the U.S. the right to claim access to extra seabed resources if it were party to the Law of the Sea treaty. In the meantime, the US-based Arctic Oil & Gas Company has filed a claim with the UN to act as the sole “development agent” in the Arctic region, with exclusive rights to extract oil and gas from the central Arctic Ocean currently beyond the territorial control of the polar nations. [See also *Disputes over Polar Regions Expands* in October 2007, *Arctic Debate Intensifies* in August 2007, and other similar items in previous environmental security reports.]

### Military Implications:

[Similar to previous on the same issue] It is likely that discussions for clear international regulations concerning the Arctic region will increase rapidly, opening the potential for new military roles in that region to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures.

### Sources:

Climate Change and International Security. Paper from the High Representative and the European Commission to the European Council

[http://www.consilium.europa.eu/ueDocs/cms\\_Data/docs/pressData/en/reports/99387.pdf](http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/reports/99387.pdf)

U.S. firm lays claim to 'potentially vast' Arctic oil resources

<http://www.canada.com/ottawacitizen/news/story.html?id=2699b272-8fed-4da6-8c2a-d54390f7d54b>

Arctic Melt Yields Hints of Bigger U.S. Seabed Claim

<http://dotearth.blogs.nytimes.com/2008/02/12/arctic-melt-yields-hints-of-bigger-us-seabed-claim/>

Continental Slope Off Alaska 100 Nautical Miles Further Off Coast Than Assumed

<http://www.sciencedaily.com/releases/2008/02/080211134449.htm>

## 7.3 China's New Ministry of Environmental Protection

China announced the creation of five new “super ministries”: Ministry of Industry and Information, Ministry of Human Resources and Social Security, Ministry of Environmental Protection, Ministry of Housing and Urban-Rural Construction, and Ministry of Transport, and a ministerial-level national energy body to oversee energy policy across all ministries. Establishing the new environment ministry is intended to help tackle China’s growing pollution problems. Environmental monitoring and law enforcement will be high priorities, said future minister of environmental protection, Zhou Shengxian, at the 2008 National Environmental Law Enforcement

Conference. [See also *China May Restructure Environmental Effort* in October 2007, and other related items in previous environmental security reports.]

**Military Implications:**

China's growing environmental problems could cause a variety of socio-economic instability conditions nationally and internationally, resulting in major environmental security issues for many countries around the world to address. Relevant military personnel should consider increased cooperation with their Chinese counterparts on environmental security matters that could assist the new Ministry of Environmental Protection.

**Source:**

China's parliament adopts government reshuffle plan

[http://www.chinadaily.com.cn/china/2008npc/2008-03/15/content\\_6538946.htm](http://www.chinadaily.com.cn/china/2008npc/2008-03/15/content_6538946.htm)

China announces 'super-ministries', including one for environment

<http://afp.google.com/article/ALeqM5giPUHFKPnbJWleDQdRstP-tEg-0w>

Environment chief vows to add muscle

[http://www.chinadaily.com.cn/bizchina/2008-03/25/content\\_6563818.htm](http://www.chinadaily.com.cn/bizchina/2008-03/25/content_6563818.htm)

#### **7.4 EU Leaders Support the 20/20/20 Energy Plan**

At the recent EU summit (March 13-14), member states' leaders indicated support for the EU's 20/20/20 energy plan. The package should receive full political backing by all governments by the end of 2008 in order to be discussed at the EU Parliament in the first week of 2009. In spite of the tight deadline, EU officials are confident that the plan will pass in time to give the EU a better negotiating position at the December 2009 UN climate change summit. At the same time, despite some countries' disagreements and complaints, the European Commission reaffirmed that it is not willing to change the timetables and national targets. However: 1) some concessions were agreed for energy intensive industries such as steel and cement factories, which could get free pollution permits—instead of having to buy them by auction, and 2) foreign companies might also be made to take part in the emissions trading system (ETS). [See also *European Commission's New Low-carbon 20/20/20 by 2020 Energy Plan* in January 2008 environmental security report.]

**Military Implications:**

[Same as previous on this issue] The military should follow the outcomes of these proposals that might result in new environmental regulations and new standards policies, and consequently emerging strategies. The aim would be to ensure that military activities could adjust to any new requirements in Europe.

**Sources:**

EU to commit to tight legislative deadline for green goals

<http://euobserver.com/9/25832/?rk=1>

Brussels defends EU burden-sharing on climate change

<http://euobserver.com/9/25829/?rk=1>

Brussels to grant some concessions to industry in environment proposals

<http://euobserver.com/9/25839/?rk=1>

#### **7.5 Waste Disposal a Matter of Discord or Cooperation between Palestine and Israel**

Waste disposal might additionally fuel the increasingly tense relations between Israel and the Palestinian Authority as waste is transferred from Israel to areas of the West Bank. The main

problem is that large quantities of building waste are deposited in pirate sites near Palestinian villages. Some contain toxic substances polluting the environment, leaking into the water system, and endangering the public health of both Palestinian and Israeli people. Scientists and environmentalists call on the two parties to leave aside diplomatic disagreements and develop collaborative relations on environmental issues generally and on solving the waste problem specifically. [See also *Water Scarcity* in March 2007, and *Iran and Iraq Sign Environment Protection Agreement* in January 2008 environmental security reports.]

**Military Implications:**

Military liaisons assisted by military personnel with toxic waste management experience should explore opportunities for assistance and applying the Army Strategy for the Environment.

**Source:**

Apart from the security problems

<http://www.haaretz.com/hasen/spages/960889.html>

## 7.6 Plastic Threats to the Marine Environment

Researchers are increasingly warning of the long-term threat from plastic waste to the marine environment as studies confirm the risks from hidden contamination. While most attention is focused on dangers that visible items of plastic waste pose to wildlife, new researches investigate the impact of underwater microscopic plastic fragments on tiny marine organisms. Researchers note that all continents experience plastic contamination and plastic particles could represent as much as one-quarter of the total weight of sandy material samples gathered on shorelines at the high tide mark. [See also *The Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* Enters into Force in March 2006 and other previous environmental security reports on similar issues.]

**Military Implications:**

Increased awareness and compelling evidence of the impact of plastics on the environment in general, and the marine one specifically, might trigger updates to such regulations as the Convention on the Prevention of Marine Pollution or even new rules specifically regulating plastics. The military should ensure that its procedures comply with the best practices, and reduce, as much as possible, dumping of polluting material (such as plastic) in marine or other non-appropriate environments to avoid criticism and eventual penalties. It should also increase efforts to use biodegradable materials whenever possible and replace the non-degradable ones.

**Source:**

Warning on plastic's toxic threat

<http://news.bbc.co.uk/2/hi/science/nature/7316441.stm>

## 7.7 Water Footprint Measuring System

On the occasion of World Water Day, reminding of possible conflicts over water, UN Secretary-General Ban Ki-moon urged the international community to create strategies for using water more efficiently and sharing it more fairly. Similarly, researchers suggest that it is timely to use a system to measure water footprint similar to that used for carbon footprint. A symposium held by the UNESCO-IHE (Institute for Water Education) discussed the “virtual water” issue specifically related to the world energy markets. It was pointed out that present practices are not sustainable and therefore it is necessary to introduce a system to measure water footprint in order

to help better understand water issues, identify areas with highest impact, and develop adequate policies. Calculating a water footprint might increase awareness and influence practices, similar to the impact that carbon footprint has. [See also *World Leaders Discuss Environmental Security Policies at Davos* in January 2007, *Water Scarcity* in March 2007, *World Water Forum* in March 2006, and other previous environmental security reports on the water issue.]

**Military Implications:**

[Similar to others on this issue] The military should intensify efforts to improve and accelerate dialogue and cooperation for an international water management system and the design of an international adaptation and mitigation strategy addressing increased water scarcity. Formulating installation water footprints could be a tool for improving water resource use effectiveness and reducing costs.

**Sources:**

World's Water Needs Grow More Urgent

<http://www.ens-newswire.com/ens/mar2008/2008-03-17-01.asp>

Experts Seek Answers on Water Footprint

<http://www.washingtonpost.com/wp-dyn/content/article/2008/03/27/AR2008032702567.html>

Waterfootprint <http://www.waterfootprint.org>

Water Trade—A Virtual Reality? UNESCO-IHE symposium

<http://legacy.citg.tudelft.nl/wmg/dispuut/symposium/index.html>

## 7.8 Kyrgyzstan's Deforestation Threatens Central Asia's Security

The Kyrgyz government's Agency for Environmental Protection and Forestry and environmentalists have issued warnings about the country's rate of deforestation and its consequences. It is estimated that over the past 50 years, half of the forest cover was lost, and illegal logging continues at a rate about at par with the legal one, maintained by corruption and the population's low living standard. Kyrgyzstan forests are crucial for the whole Central Asian ecosystem, their disappearance causing water scarcity, health problems, and more frequent natural disasters such as floods, landslides and droughts. Experts demand better enforcement of international environmental regulations to which the country is party. [See also UN General Assembly Adopts Global Forest Agreement in December 2007 and *Environment and Security Program in the East-Caspian Region* in September 2007, *Network of Environment Centres in Central Asia* in February 2004, and *Prospective International Agreements for Mountain Regions* in October 2002 environmental security reports.]

**Military Implications:**

Given the vulnerability of the region, it is important that international efforts intensify to save biodiversity and ecosystems upon which livelihoods depend, in order to minimize the potential of social unrest. The military responsible for activities or stationed in the region should aid this effort by helping their counterparts develop monitoring and compliance mechanisms or taking physical actions, as may be appropriate under bilateral agreements.

**Source:**

Kyrgyz Greens Warn of Deforestation Risks

<http://www.ens-newswire.com/ens/mar2008/2008-03-11-02.asp>

## 7.9 Climate Change

### 7.9.1 Food and Water Security

An EU report, *Climate Change and International Security* [see item 8.1], warns that water scarcity and food insecurity caused by rising prices and diminishing harvests, particularly in the Middle East, are likely to cause “serious security risks” for Europe and internationally.

African Environment Day, organized by the African Union (AU) Commission to raise awareness of the impact land degradation and desertification have on Africa’s development, was observed under the theme “Adapting to Climate Change for Livelihood Security in Africa.”

### 7.9.2 Melting Glaciers and Sea Ice

At the southwestern edge of the Wilkins Ice Shelf of western Antarctica, a chunk of ice with an area of about 400 sq km broke up into icebergs. This might trigger the disintegration of a larger part of the Wilkins Ice Shelf, which totals about 14,500 sq km, and is now connected by only a 6 km strip of ice.

According to data of UNEP’s World Glacier Monitoring Service (WGMS), the average rate at which the world’s glaciers are melting and thinning has more than doubled between the years 2004-2005 and 2005-2006. Analyzing data from around 100 glaciers, with continual annual data series for 30 reference glaciers since 1980, WGMS found that average ‘water equivalent’ loss has risen from 0.3 meter per year between 1980 and 1999, to about 0.5 meter per year after the year 2000, and estimates of 1.4 meters in 2006. Out of the 30 reference glaciers only one (Echaurren Norte in Chile) thickened in 2006 compared to 2005, while all the others shrank, with European glaciers being among the most affected. Glaciers represent the only fresh water source for millions of people around the globe.

### 7.9.3 Rising Sea Levels

Bangladesh, chair of the Least Developed Countries, insists that developed countries increase LDC’s access to investment, resources and technologies needed to adapt to climate change effects. Of more than \$1 billion pledged at the 2002 Johannesburg Earth summit for improving preparedness of vulnerable countries, less than \$180 million have been delivered, and no contributions were yet made to the investment fund set at Bali. Being the most at risk, LDCs demand to take an active part in the global climate talks. At Bangladesh’s request, Britain offered financial support for LDCs participation in negotiations and will host a conference in May addressing Bangladesh’s vulnerability. A one-meter sea level rise would flood about one-third of Bangladesh, affecting about 25–30 million people.

Recent data from the U.S. Geological Survey warns of the danger that rising sea levels over the next 50 years represent to the U.S. coastal population. Among the most threatened are the islands of California’s Sacramento-San Joaquin delta, the islands in Chesapeake Bay, parts of the Louisiana coast, and the New York subway system. However, the 5,000 residents of the California’s delta islands are likely to become the first environmental refugees in the United States. The threat is the result of the interplay of two factors both effects of climate change: rising sea levels, and increased rainfalls over snow in the Sierra Mountains as a result of warming temperatures, thus raising the risk of floods.

### 7.9.4 Adaptation

“The UN estimates that all but one of its emergency appeals for humanitarian aid in 2007 were climate related,” notes the *Climate Change and International Security* report.

The Kyoto Protocol’s Adaptation Fund Board held its inaugural meeting in Bonn, Germany, on March 28, 2008. The Fund will finance concrete adaptation projects and programs in

developing countries. The fund now estimated at about \$58.4 million is expected to increase to \$80-300 million over 2008-2012. The finance source is a 2% levy of the Clean Development Mechanism, so it is “not reliant on donor funding or overseas development assistance. This is the climate regime beginning to become self-financing,” noted Yvo de Boer, Executive Secretary of the UN Framework Convention on Climate Change.

The Caribbean states agreed to set up a joint tsunami early warning center by 2010. The center will relay information from national geological institutes across the region. Barbados, Puerto Rico, and Venezuela were named as possible hosts of the center, which would have a \$250,000 annual budget funded by national governments, France, the U.S., and UNESCO.

#### 7.9.5 Post-Kyoto Negotiations

The first meeting since the December Bali conference for negotiating a post-Kyoto climate change treaty is being held in Bangkok, March 31-April 4. It aims to move forward the Bali Roadmap. Key issues on the agenda include limiting greenhouse gas emissions, adaptation, mitigation, deployment of climate-friendly technologies, and financing. [Note: the meeting was ongoing at the time of this writing and the outcomes will be included in next month’s report.] It is hoped that negotiations will be concluded next year at a major Copenhagen summit.

China’s CO<sub>2</sub> emissions grew much more than previous estimates, revealed a new analysis by economists at the University of California. The Intergovernmental Panel on Climate Change estimated annual CO<sub>2</sub> increase in the region that includes China at 2.5%–5% for 2004–2010, while the new University of California analysis estimates a growth rate of at least 11% for the same time period. This finding reinforces beliefs that any climate change treaty should include mandatory emission targets for big emitter developing countries.

Humanity lost an important decade of actions to curb global warming, because of protracted negotiations, noted Robert Watson, now chief scientific adviser at the U.K. environment ministry, and former chairman of the UN Intergovernmental Panel on Climate Change. He emphasized the swift need for a new treaty that would set more ambitious long-term goals for reducing greenhouse gas emissions in order to limit temperature rise to 2°C by the end of the century. Mr. Watson considers that the targets for developed countries should be 80% rather than the projected 60%, while for developing countries the allowed rise should be 60% rather than a projected 140%. He underlined that such goals imply the implementation of a mixture of technologies and increased technology transfer.

#### **Military Implications:**

[Same as previous on similar issues] Increasingly more compelling evidence and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects. Hence, the military should be doing its part in reducing greenhouse gas emissions and preparing to help mitigate the human-made and natural catastrophes that could ensue.

**Sources:** (see a more expanded list in the [Appendix](#))

EU warns of climate change threat

<http://news.bbc.co.uk/2/hi/europe/7287168.stm>

Africa: AU Marks Environment Day

<http://allafrica.com/stories/200803041273.html>

Earth from Space: Further break-up of Antarctic ice shelf

[http://www.esa.int/esaEO/SEMMX4R03EF\\_index\\_0.html](http://www.esa.int/esaEO/SEMMX4R03EF_index_0.html)

Meltdown in the Mountains.

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=530&ArticleID=5760&l=en>

Remote control

<http://www.guardian.co.uk/environment/2008/mar/26/bangladesh>

Rising sea levels could swallow California's delta islands

<http://www.helenair.com/articles/2007/06/04/montana/000arise.txt>

Latest round of UN climate talks to start next week

<http://www.un.org/apps/news/story.asp?NewsID=26140&Cr=climate&Cr1=>

Caribbean plans tsunami warning system by 2010

<http://www.alertnet.org/thenews/newsdesk/N13326240.htm>

Bangkok Climate Change Talks - 31 March to 4 April 2008

[http://unfccc.int/meetings/intersessional/awg-lca\\_1\\_and\\_awg-kp\\_5/items/4288.php](http://unfccc.int/meetings/intersessional/awg-lca_1_and_awg-kp_5/items/4288.php)

Growth in China's CO<sub>2</sub> Emissions Double Previous Estimates

<http://www.ens-newswire.com/ens/mar2008/2008-03-11-01.asp>

Climate change action delayed by decade's debate

<http://business.smh.com.au/climate-change-action-delayed-by-decades-debate/20080312-1yux.html>

## 7.10 Nanotechnology Safety Issues

Some noteworthy nanotechnology safety activities from this month (more detailed descriptions of each are available in the [Appendix](#)) are:

- EPA's Toxic Release Inventory (TRI) could be applied to the production and commercialization of nanotechnology, providing there are some specific amendments to take care of the special aspects of nanotechnology risk assessment, according to a legal analysis by the Project on Emerging Nanotechnologies (PEN) of the Woodrow Wilson Center and the Pew Charitable Trusts.
- *Nanotechnologies at the OECD* prepared by OECD for Forum VI of the Intergovernmental Forum on Chemical Safety (IFCS) describes the two activities of OECD related to nanotechnologies: 1) the activities of the Working Party on Manufactured Nanomaterials (WPMN); and 2) the Working Party on Nanotechnology (WPN).
- The *Explosivity And Flammability of Nanopowders* report by the European Nanosafe2 project, analyzes nanopowders behavior as to their explosivity and flammability. It concludes that behavior depends on the materials and surfaces to which nanopowders are applied; and hence, "Specific prevention and protection measures should then be taken."
- A new report from Friends of the Earth calls for action to "stop the sale of all nano food, packaging, and agricultural chemicals" until adequate scientific regulations and labeling are enacted.

### Military Implications:

[Same as previous on this issue] Military personnel concerned with nanotech issues, particularly health and safety, should contribute their views to these activities. Also, relevant military personnel should review the information generated by such activities to improve military and contractor practices, as well as to assist and cooperate with the organizations working on those issues for enriching their studies.

### Sources:

Federal Toxics Disclosure Law Could Help Inform Public Of Nanotechnology Risks

[http://www.nanotechproject.org/news/archive/toxics\\_law](http://www.nanotechproject.org/news/archive/toxics_law)

Forum VI Sixth Session of The Intergovernmental Forum On Chemical Safety  
[http://www.who.int/ifcs/documents/standingcommittee/nano\\_oecd.doc](http://www.who.int/ifcs/documents/standingcommittee/nano_oecd.doc)

What about explosivity and flammability of nanopowders?

<http://www.nanosafe.org/node/910>

Nanotech Exposed in Grocery Store Aisles

[http://action.foe.org/pressRelease.jsp?press\\_release\\_KEY=343](http://action.foe.org/pressRelease.jsp?press_release_KEY=343)

## **Item 8. Reports Suggested for Review**

### **8.1 Security Implication of Climate Change to the EU**

*Climate Change and International Security. Paper from the High Representative and the European Commission to the European Council* analyses the security implications of climate change in general and with specific implications to the EU, and makes some recommendations for EU policies. It reviews the main categories of threats posed by climate change to security (Conflict over resources; Economic damage and risk to coastal cities and critical infrastructure; Loss of territory and border disputes; Environmentally-induced migration; Situations of fragility and radicalization; Tension over energy supply; and Pressure on international governance) and then addresses vulnerabilities by specific regions (Africa; Middle East; South Asia; Central Asia; Latin America and the Caribbean; and The Arctic). The report concludes that “The impact of climate change on international security is not a problem of the future but already of today and one which will stay with us” and underlines that the European Security Strategy and related proposals “should take account of the security dimension of climate change.” Some specific recommendations include “Focus attention on the security risks related to climate change in the multilateral arena; in particular within the UN Security Council, the G8 as well as the UN specialised bodies (among others by addressing a possible need to strengthen certain rules of international law, including the Law of the Sea),” capacity building from detection to adaptation, addressing migration issues, and adapting cooperation with other countries to the new realities induced by climate change.

#### **Military Implications:**

Although with specific recommendations for the EU, the report is a good overview of the security implications of climate change that apply similarly to North America. Relevant military personnel should review the report for possible inputs for U.S. strategy.

#### **Sources:**

Climate Change and International Security. Paper from the High Representative and the European Commission to the European Council

[http://www.consilium.europa.eu/ueDocs/cms\\_Data/docs/pressData/en/reports/99387.pdf](http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/reports/99387.pdf)

EU must boost military capabilities in face of climate change

<http://euobserver.com/9/25811/?rk=1>

### **8.2 Recommendations for Addressing U.S. Environmental Security**

*Insecure About Climate Change* is an essay summarizing a recent special report for the Council on Foreign Relations, *Climate Change and National Security: An Agenda for Action*. It makes some specific recommendations to “strengthen national security by reducing U.S. vulnerabilities to climate change at home and abroad,” such as: establishing a new “**deputy undersecretary of**

**defense position for environmental security** [emphasis added]... to redress the insufficient institutionalization of climate and environmental concerns in the Department of Defense; ... several senior positions in the National Security Council dedicated to environmental security” and eventually a “special advisor to the president on climate change with some budgetary authority.” The author also makes some financial suggestions to help developing countries prepare for climate change, “including \$100 million (over several years) for military-to-military environmental security workshops; ...another \$100 million per year to support an African Risk Reduction Pool” as “part of a broader international risk reduction effort that... should be on par with the president’s five-year, \$15 billion emergency plan for AIDS relief.” The author of the essay and report, Joshua Busby, is assistant professor at the LBJ School of Public Affairs at the University of Texas at Austin and fellow with the Robert S. Strauss Center for International Security and Law.

**Military Implications:**

Relevant military personnel should review and consider the essay and the report as inputs for improving institutional and policy structures to better address climate change-related security issues.

**Sources:**

*Insecure About Climate Change*

<http://www.washingtonpost.com/wp-dyn/content/article/2008/03/21/AR2008032102631.html?hp=opinionsbox1>

*Climate Change and National Security. An Agenda for Action*

<http://www.cfr.org/publication/14862>

### 8.3 Environment and Human Health Integration

*Integrating Environment and Human Health, and Climate, Poverty and Health: Time for Preventive Medicine* published by the National Council for Science and the Environment (NCSE) address the interconnection between human health and environmental components. The recommendations include: interdisciplinary approaches for better integration of environmental and health perspectives; improved communication between environmental and health communities, and between scientists and decision makers and the public; and improving priority setting in science. The NCSE activities in this area are continuing.

**Military Implications:**

Relevant military personnel should review and consider the reports for possible additional inputs of an interdisciplinary approach to reduce security threats and improve force protection.

**Sources:**

*Integrating Environment and Human Health*

<http://www.ncseonline.org/2007conference/NCSE%2007%20Conf%20Report%20FINAL.pdf>

*Climate, Poverty and Health: Time for Preventive Medicine*

<http://www.ncseonline.org/2007conference/07ChafeeReportFINAL.pdf>

Environment and Health conference website

<http://www.ncseonline.org/2007conference>

## APPENDIX

### Reference Details

This Appendix contains expanded background information on some items.

#### 7.9 Climate Change

**Sources:** (a more expanded list)

EU warns of climate change threat

<http://news.bbc.co.uk/2/hi/europe/7287168.stm>

Africa: AU Marks Environment Day

<http://allafrica.com/stories/200803041273.html>

Antarctic Ice Shelf Disintegration Underscores a Warming World

[http://nsidc.org/news/press/20080325\\_Wilkins.html](http://nsidc.org/news/press/20080325_Wilkins.html)

Antarctic ice shelf 'hangs by a thread'

[http://www.antarctica.ac.uk/press/press\\_releases/press\\_release.php?id=376](http://www.antarctica.ac.uk/press/press_releases/press_release.php?id=376)

Earth from Space: Further break-up of Antarctic ice shelf

[http://www.esa.int/esaEO/SEMMX4R03EF\\_index\\_0.html](http://www.esa.int/esaEO/SEMMX4R03EF_index_0.html)

Meltdown in the Mountains. Record Glacier Thinning Means No Time to Waste on Agreeing New International Climate Regime

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=530&ArticleID=5760&l=en>

Glaciers suffer record shrinkage

[http://news.bbc.co.uk/2/hi/in\\_depth/7299561.stm](http://news.bbc.co.uk/2/hi/in_depth/7299561.stm)

Remote control

<http://www.guardian.co.uk/environment/2008/mar/26/bangladesh>

Rising sea levels could swallow California's delta islands

<http://www.helenair.com/articles/2007/06/04/montana/000arise.txt>

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Caribbean plans tsunami warning system by 2010

<http://www.alertnet.org/thenews/newsdesk/N13326240.htm>

Caribbean Tsunami Warning System to Take Step Forward With Un-Backed Group

<http://www.un.org/apps/news/story.asp?NewsID=25948&Cr=tsunami&Cr1=>

Bangkok Climate Change Talks - 31 March to 4 April 2008

[http://unfccc.int/meetings/intersessional/awg-lca\\_1\\_and\\_awg-kp\\_5/items/4288.php](http://unfccc.int/meetings/intersessional/awg-lca_1_and_awg-kp_5/items/4288.php)

Latest Round of UN Climate Talks to Start Next Week

<http://www.un.org/apps/news/story.asp?NewsID=26140&Cr=climate&Cr1=>

Global climate talks in Bangkok to set stage for future pact

<http://www.terrardaily.com/2007/080328025105.qidheipz.html>

Growth in China's CO2 Emissions Double Previous Estimates

<http://www.ens-newswire.com/ens/mar2008/2008-03-11-01.asp>

Climate change action delayed by decade's debate

<http://business.smh.com.au/climate-change-action-delayed-by-decades-debate/20080312-1yux.html>

## **7.10 Nanotechnology Safety Issues**

More detailed descriptions of some noteworthy nanotechnology safety activities from this month:

### Federal Toxics Disclosure Law Could Provide Data on Nanotechnology Risks

According to a news release, the Project on Emerging Nanotechnologies (PEN) of the Woodrow Wilson Center and the Pew Charitable Trusts has released a legal analysis that finds that EPA's Toxic Release Inventory (TRI) could be applied to the production and commercialization of nanotechnology, although the applicable statute may need to be amended to take care of the special aspects of nanotechnology risk assessment. The report also emphasizes that additional disclosure-related measures for nanotechnology risks should be considered and that "additional research is required to determine whether application of TRI to nanomaterials should be pursued as a policy priority in the near term".

Source:

Federal Toxics Disclosure Law Could Help Inform Public Of Nanotechnology Risks

[http://www.nanotechproject.org/news/archive/toxics\\_law](http://www.nanotechproject.org/news/archive/toxics_law)

### Nanotechnologies at the OECD

According to nanoforum.org, "The OECD has prepared an overview of its work on nanotechnologies for Forum VI of the Intergovernmental Forum on Chemical Safety (IFCS). The paper, titled Nanotechnologies at the OECD, describes the two activities of OECD related to nanotechnologies: i) the activities of the Working Party on Manufactured Nanomaterials (WPMN); and ii) the Working Party on Nanotechnology (WPN)." The stated objective of WPMN is "to promote international co-operation in human health and environmental safety related aspects of manufactured nanomaterials (MN), in order to assist in the development of rigorous safety evaluation of nanomaterials."

Source:

Forum VI Sixth Session of The Intergovernmental Forum On Chemical Safety

[http://www.who.int/ifcs/documents/standingcommittee/nano\\_oecd.doc](http://www.who.int/ifcs/documents/standingcommittee/nano_oecd.doc)

### Explosivity and Flammability of Nanopowders

An item from nanoforum.org announces a new report on this subject from the NANOSAFE2 project, "One of the main questions asked about nanopowders, when it comes to explosivity and flammability, is: do nanopowders behave like other powders and, as such, can they more readily ignite and explode? During this study, carried out in the frame of the European Nanosafe2 project, safety parameters of nanopowders and their associated techniques and practices have been characterised for a representative set of particles of industrial relevance." It concludes that behavior depends on the materials and surfaces on which nanopowders are applied and hence, "Specific prevention and protection measures should then be taken."

Source:

What about explosivity and flammability of nanopowders?

<http://www.nanosafe.org/node/910>

**Report Warns of Nano Hazards in Foods**

A new report from Friends of the Earth notes that “Untested nanotechnology is being used in more than 100 food products, food packaging and contact materials currently on the shelf, without warning or new FDA testing.” and “calls on the FDA to stop the sale of all nano food, packaging, and agricultural chemicals until strong scientific regulations are enacted to ensure consumer safety and until ingredients are labeled.”

Source:

Nanotech Exposed in Grocery Store Aisles

[http://action.foe.org/pressRelease.jsp?press\\_release\\_KEY=343](http://action.foe.org/pressRelease.jsp?press_release_KEY=343)